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ABSTRACT

This paper examines the needs of the failure-oriented junior college student, presents the learning resources center as a major tool in junior college instruction, and develops a systems approach to the design of a comprehensive learning resources center. Since junior colleges accept a full range of students, including many of low ability, conventional teaching methods are not adequate. Teaching the junior college student requires special attention to motivation, guidance, basic skills, instructional support, and instructional design. The learning resources center can help to meet these needs by providing an integrated facility where the student can develop needed skills, a positive attitude towards learning, and the ability to use the counseling resources provided by the college. Also it can provide the administration with information on the characteristics of the students served. The components of the learning resources center and their integration into a unified system are described. (MS)

SYSTEMS ANALYSIS

OF

A LEARNING RESOURCES CENTER

BY

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TABLE OF CONTENTS

1. Introduction

The junior college may yet prove to be the most important educational innovation of the 20th Century. It has emerged as a new kind of college, a comprehensive democratic institution offering a wide variety of terminal programs and community services in addition to the normal college transfer program. The junior college is an institution designed to meet the post high school educational needs of all the community. The public has accepted this comprehensive view and the colleges have accepted it as their charge, but is this in fact the way the junior college works? Does the junior college in fact provide an open door to equal educational opportunity for all? This paper will examine the needs of the failure-oriented student in the junior college, present the Learning Resources Center as a major tool in junior college instruction, and develop a systems approach to the design of a comprehensive Learning Resources Center.

1.1 The Failure-Oriented Student

There is a wide range in student characteristics: age, educational, social, and economic background, occupational and personal interests. Most colleges admit only those students in a narrow range of abilities and interests, those who have already demonstrated that they can survive in our conventional education systems. The junior college, however, must accept the full range of students. (8) Given this diverse student population, we would expect instruction in a junior college to be much different from conventional instruction with heightened emphasis on techniques and facilities for teaching the low ability student. This is rarely the case. We use the same methods and procedures even though the success rate of junior college indicates that these traditional methods are not adequate.

Dr. Ralph Tyler (35) has listed a number of invalid assumptions usually made, implicitly or explicitly, about junior college students:

(1) The junior college student is motivated to participate in traditional academic activities. They are strongly motivated to try again, to succeed academically, despite the failures of high school.

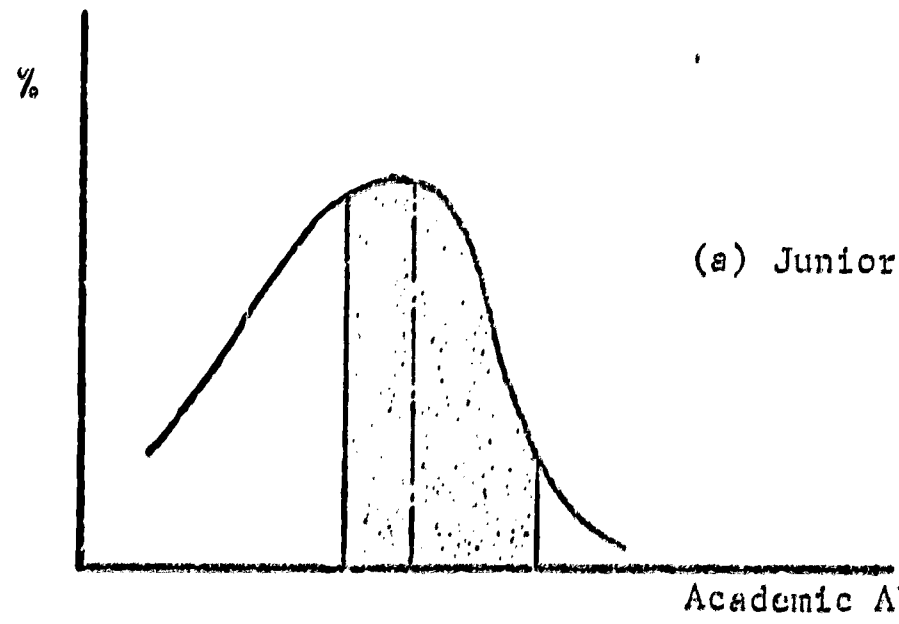
(2) They have the background of conceptual skills needed for successful academic work.

(3) They have the attitudes and values needed to succeed in traditional educational situations. Instruction is typically focused on the teaching of "knowledge" and skills - information transmission, cognitive and psychomotor learning - rather than affective or attitudinal skills.

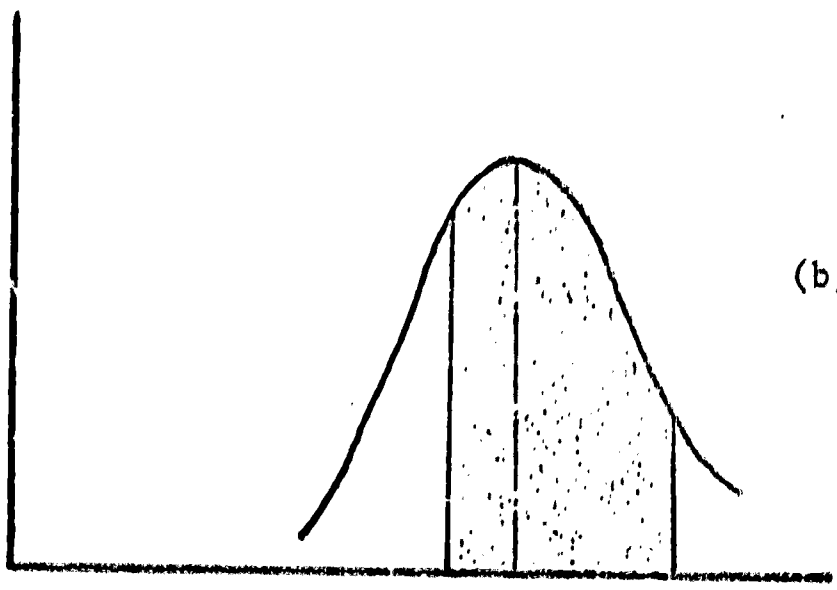
(4) The out-of-class environment of junior college students can be depended upon to reinforce and extend any learning stimulated in the classroom. For example, we usually assume that the reading and writing skills learned in formal classes will be exercised outside of class.

(5) The range of the abilities and interests of junior college students is sufficiently narrow that it is reasonable to use traditional methods of instruction. Typically, our modes of instruction assume a fairly homogeneous group and all planning is geared to some mythical average student. (Fig. 1)

These assumptions are not met by most junior college students. Traditional methods of instruction have become associated with failure for them. Many junior college students have developed an expectation of failure and exhibit a pattern of repeated failure - a failure syndrome - that strongly limits the success of any traditional program of instruction. For this failure-oriented student every educational encounter is colored with the expectation and the humiliation of failure. No amount of teacher skill or embellishment with A/V materials or other hardware will, of themselves, entirely offset the pattern of failure he has learned in twelve years of schooling.



(a) Junior College



(b) Four-year College
or University

Traditional instruction is geared to those students just below and considerably above the mode in terms of academic ability, motivation, background, study skills, etc. The result is that there are, in the junior college, a large number of students who do not profit from conventional instruction.

Fig. 1

Typically, 75% of the students entering junior college express the intention of transferring to a four year institution. Only one-third of these actually transfer. Thus we must classify the educational experiences of half of all junior college students as failure. The open door that leads to instruction cast in a traditional mold based on incorrect assumptions about students is an open door to failure for many of them.

1.2 The Learning Resource Center

If the pattern described above is typical of the failure-oriented student, then any comprehensive plan of help must concern itself with the following factors:

(1) Motivation The learner must be involved in the learning activities. Only through deep involvement will the disadvantaged learner be stimulated to try new ways of reacting and adopt new and more effective modes of behavior. The instructional situation and materials must be devised with this end in view rather than simply selected on the basis of traditional practice.

(2) Guidance The failure-oriented learner must have guidance in selecting realistic goals not simply on a single occasion when he first registers in the college, but continuously during the instructional process. He must be guided to select new and more effective behaviors as his skills and aspirations change.

(3) Basic Skills He must be given specific training in the basic cognitive skills required if he is to succeed in his chosen educational goal. The skills of reading, writing, basic arithmetic - of communicating and processing information - must be acquired. Typically, junior colleges attempt to do this by providing "remedial" courses (or, if they are sensitive to the failure syndrome, "developmental courses") in which an attempt is made to provide these skills

in a traditional classroom-bound, lecture-oriented, designed-for-failure setting.

(4) Instructional Support The failure-oriented student lacks the outside support of an educated, interested family with positive attitudes toward education. He fails because he has no person to turn to for help when the going gets rough. If the junior college is to provide truly equal opportunity, that is, equal opportunity for every student to succeed, then it is clear that for many students the traditional one teacher/30 students per class/3 hours per week pattern is not adequate. More of our resources of teacher time, equipment, facilities, and money will be needed for the failure-oriented student than for the average college student. Administrators and faculty must face the fact that a disproportionately large fraction of their resources must be spent on these students if the open door policy is to be realized in fact rather than in rhetoric.

(5) Instructional Design The failure-oriented student must be allowed to proceed to his goals at a rate appropriate to his abilities. He has endured a lifetime of moving from task to task, class to class, grade to grade, always at best a partial failure, never deriving from his educational experiences the satisfaction of a clear-cut success. If he is to succeed he must escape from the pattern of fixed-time courses and work at his own rate on meaningful activities individually prescribed to meet his needs.

(7) Attitudes Both the attitudes of teachers and of students must be modified so that they see educational activities positively. The goal is to lead the student to derive satisfaction from the intellectual activity itself, not to force him to perform under the coercion of grades and failure. We cannot use the threat of failure as a device

for helping the failure-oriented student. Many of his problems exist precisely because he has not developed effective positive behaviors that will enable him to deal constructively with the threat of failure.

Many colleges have sought to solve the problems of the disadvantaged, remedial, or failure-oriented student by setting up a special center or complex of activities and resources (9, 10, 11, 12, 13). Many names have been used to identify these remedial systems and they differ greatly in their structure and goals. We will use the term Learning Resource Center (LRC) as a name for a system of learner-directed developmental activities. Many varieties of LRC exist:

(1) Instructional Materials Center as LRC An instructional materials center (IMC) is an accumulation of commercially available and locally produced educational materials, especially programmed, or self-instructional materials (9). The IMC is often simply an offshoot of the school library. Many authors use the terms LRC and IMC as synonyms (5, 10, 21, 23, 24, 27, 31, 33). The IMC may be simply a collection of print materials with study carrels, as at Los Angeles City College (27), or as sophisticated as those at Miami-Dade (24), Florida Atlantic University (21), or North Carolina (5).

At Marin Junior College the "Learning Resources Center" is a facility designed to support and encourage instructional research and development on the part of the faculty. It is an instructional research center.

(2) Reading Lab as LRC The needs of the low ability student are most often met by separate reading and/or writing lab facilities. These programs are designed to improve the reading or writing skills of inadequately prepared students. The purpose of and justification for these programs has been adequately explored (1, 4, 20, 22). Many

reading programs are class-centered, some make use of modern A/V equipment, but very few involve themselves broadly into the needs of the failure-oriented student.

(3) Study Skills Center as LRC Many junior colleges attempt to help the low ability student by setting up programs specifically designed to improve those general cognitive skills underlying academic success (16). Typically, study skills are taught using the usual lecture course methods. It is no surprise that most of these are ineffective.

(4) Audio-tutorial System as LRC The independent study program developed by S. N. Postlethwait (28) at Purdue has been modified to teach remedial classes in reading and English at several schools (32,26). These programs require a certain level of cognitive and attitudinal skill that would seem to assure failure if they are used with the very low ability failure-prone student.

In the present paper we will reserve the term Learning Resources Center (LRC) to describe an integrated approach to teaching the reading, writing, basic arithmetic, study and attitudinal skills necessary for the success of the low-ability, failure-oriented junior college student. It implies a systematic approach to the problems of ineffective communication skills, unrealistic vocational goals, limited background knowledge, ineffective information processing skills, and low self-esteem that are typical of these students.

2. Design of Complex Educational Systems

A system is a set of parts coordinated to accomplish a set of goals. The following elements are a necessary part of any system: (a) it must have a large number of functionally related, inter-connected components; (b) it is concerned with repeatable operations; (c) it has a common purpose or system integrity (6, 7).

Obviously, a learning resources center has these elements: its components are students, teachers, instructional materials, facilities, processes; its operations involve the processing of individual students according to their needs; the purpose is intimately tied to the needs of students.

The systems approach is a planning device, a reasoned approach to complex problems of decision and planning. It is a device designed to enable us to ask the correct questions. A systems analysis approach stresses: (a) the need to consider the whole system, (b) the need for specific goals and objectives, (c) the need for continuous evaluation of system performance, (d) the role of feedback in system evaluation and system modification, (e) the need for separating system objectives from the means of achieving them. The systems approach is an attitude, a way of approaching educational problems as a whole, and an excellent device for forcing supervisors, teachers, and other educational planners to ask the big questions, to see the big picture (14,15).

2.1 Objectives

The objectives of a system are usually embodied in (a) statements of generalized goals and (b) precise and specific performance measures related to these goals. The objectives are concrete desired outcomes of system activities. Our ability to design an effective, efficient, demonstrably successful system will directly depend upon our ability to specify the behavioral consequences of system performance. If our objectives are vague, our ability to evaluate system performance will be hampered, and there will be no sound basis upon which to modify it.

The following are a few suggested goals for a learning resources center:

(1) Provide an integrated facility, including people, space, and equipment for developing needed communication skills in:

(a) listening

(b) reading

(c) writing

(d) basic arithmetic

(e) communication of feeling and ideas

(2) Develop in students a positive attitude toward the college, toward learning, and toward continuing his education.

(3) Develop the study skills needed by the student for success in classwork.

(4) Develop student growth in self-direction, the ability to work successfully on his own.

(5) Develop the student's ability to effectively use the counseling and guidance services provided by the college.

(6) Provide a facility where students may be referred for small units of remedial or enrichment work.

(7) Provide information to the administration on the characteristics of the students served.

Specification of such general goals, while necessary and valuable for the design of an LRC, does not substitute for the more difficult task of specifying precise performance-related objectives. It is vitally important that the systems designer specify the outcomes of system activity in terms of specific student behavior change. For example, objectives may be stated in terms of improvement in reading skills as measured by standardized tests, reduction in dropout rates, performance on standardized mathematics tests, evidence of revised choices of vocational goals, improved grades in subsequent coursework, and so on.

2.2 Constraints

A system must be distinguished from its environment, those factors not under the direct control or influence of system components. These elements are "fixed" or "given" from the systems point of view and determine, at least

in part, how the system behaves. The limitations imposed on a system from without are usually labeled "constraints."

The Learning Resource Center must be designed with the following constraints in mind:

(1) Geographic: Is there space presently available for a large physical facility? Is one needed?

(2) Demographic: Student background and characteristics will remain essentially as they are now. This refers to ethnic, economic, educational, outside work responsibilities, attitudinal, etc. These factors will determine the kinds of communication problems to be met, student vocational and academic goals, levels of instruction needed, etc.

(3) Financial: Funds may become available from already allocated building funds, operating funds diverted from present uses, additional funds from local sources, government funds, foundation support. All possible funding possibilities should be explored.

(4) Technology: Much technological hardware is available, but little software is available. Few colleges have trained faculty capable of producing either educational software or A/V materials. Normally the physical equipment or technical help needed for producing A/V materials, including TV, films, filmstrips, slides, etc., are not available.

(5) Organizational: Present school organization may not be designed for an integrated, individualized approach to meeting student needs.

(a) Usually all instructional and counseling areas handle their remedial problems differently and separately.

(b) An administrative structure is needed for accomplishing and managing this function of the college. It is an activity overlapping the areas of instruction, counseling, and student activities.

(c) Means must be established for fitting the work of the students in the LRC into the existing structure of attendance accounting, grades, teaching load, scheduling, course credits, courses, semesters, etc. These organizational factors will not change much in the foreseeable future and the LRC must be integrated with them.

2.3 Components of a Learning Resources Center System

There are a number of obvious components of any learning resources center.

(1) Diagnostic function or subsystem: The diagnosis of individual student needs is usually done, if at all, by counselors, individual conferences with teachers, in classes, before registration. If students are to be given individualized instruction based on their deficiencies, aptitude, vocational goals, etc., methods must be devised for effectively administering individually prescribed instruction. The diagnostic function must be an ongoing process designed to continually monitor the needs and progress of the student.

(2) Scheduling function or subsystem: On the basis of the results of diagnostic activities students must be scheduled into the activities of the Learning Resources System - developmental courses, self-study using programmed instruction, TV, audio tapes, CAI, tutoring, individual counseling, small group activities, etc. The student must be directed to the proper activity.

(3) Distribution function or subsystem: Once scheduled into appropriate activities, students must be brought into actual contact with the instructional materials. This distribution function may involve classrooms, library-type browsing areas, TV, carrels or a circulation

center where materials may be checked out for outside use. The distribution center should also include a means for bringing the student into contact with teachers, counselors, remedial specialists, tutors, and other appropriate personnel.

(4) Instructional function or subsystem: Effective and appropriate instructional strategies must be developed. This includes the organization, selection, testing, revision and application of instructional materials and sequences.

(5) Evaluation function or subsystem: There must be devised an effective means of evaluating student performance in the learning resources center in the light of his goals and his needs as revealed by the diagnostic subsystem. The testing must be non-punitive, achievement oriented, and individualized. The evaluation subsystem should include follow-up studies of students who have been served by the learning resources center and have moved into more normal classroom situations.

(6) Information function or subsystem: There is a need to collect, record, store and make available in appropriate form that information on student performance, system functioning, diagnostic evaluation, etc., to be used by system managers and school administrators in planning the continuing activities of the system. The use of behavioral objectives and careful evaluation makes such a system readily amenable to Program Planning Budgeting if and when it is adopted.

The integration of these components into a unified system is given schematically in Fig. 2. The flow of information and students through an LRC system is shown.

THE LEARNING RESOURCES CENTER

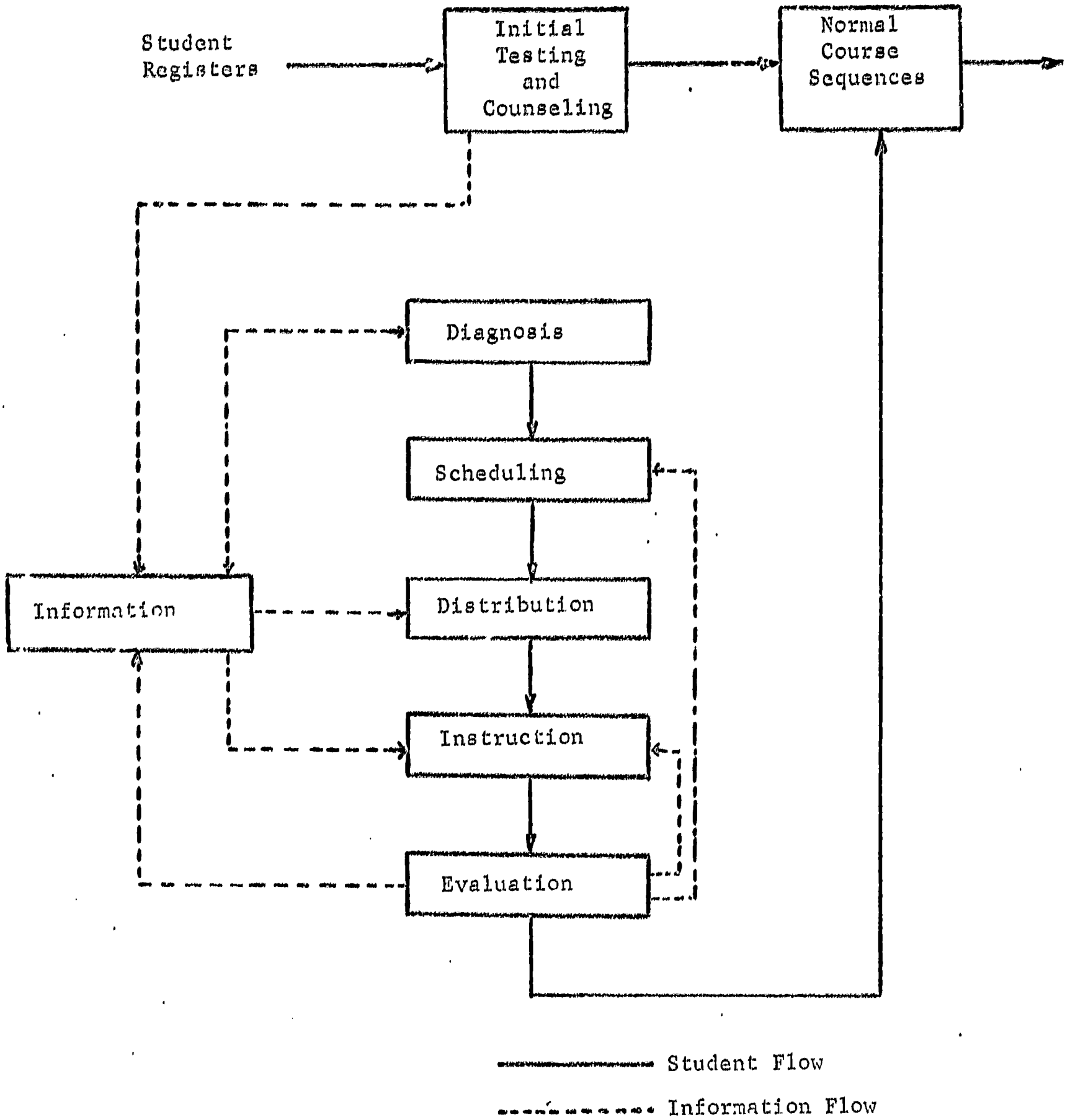


Fig. 2

2.4 Systems Design

The traditional design of complex structures is an open-loop process in which evaluation of the structure, if any is made, is not a factor in the design. Open-loop designs are made on the basis of a hunch, an attempt to copy other structures, or as an application of formal theory. Systems design is based on a closed-loop, feedback or cybernetic model in which revision of the design is dependent on evaluation based on system objectives. Fig. 3 indicates the flow of work during the design process. System evaluation is made on the basis of terminal performance specifications and designed so that we can trace out the effects of any set of choices or decisions made in implementing the objectives (2). Fig. 4 shows an application of this closed loop process to instructional design. Note that feedback may be directed to a number of places in the process.

Because of the need for clearly stated objectives and specifiable system outputs, and because of the difficulty of quantitative specification of human variables, the systems approach has tended to concentrate on the mechanical or hardware aspect of human systems. Johnson (17) has noted that this has created a concern lest the systems approach somehow mechanize and dehumanize instruction. He notes that nothing in this approach restricts planners to a mechanistic or hardware approach. Ingenuity is the only limitation, and in fact, as others have noted (30) individualization of instruction seems to be a major implication of the systems approach.

Development of the LRC System

(1) Set up system goals. Formulate broad general intentions of the system.

(2) Set up specific, behaviorally stated, objectives. These must be stated in such a way as to assure that evaluation may be performed. Evaluation must be built into the specification of objectives.

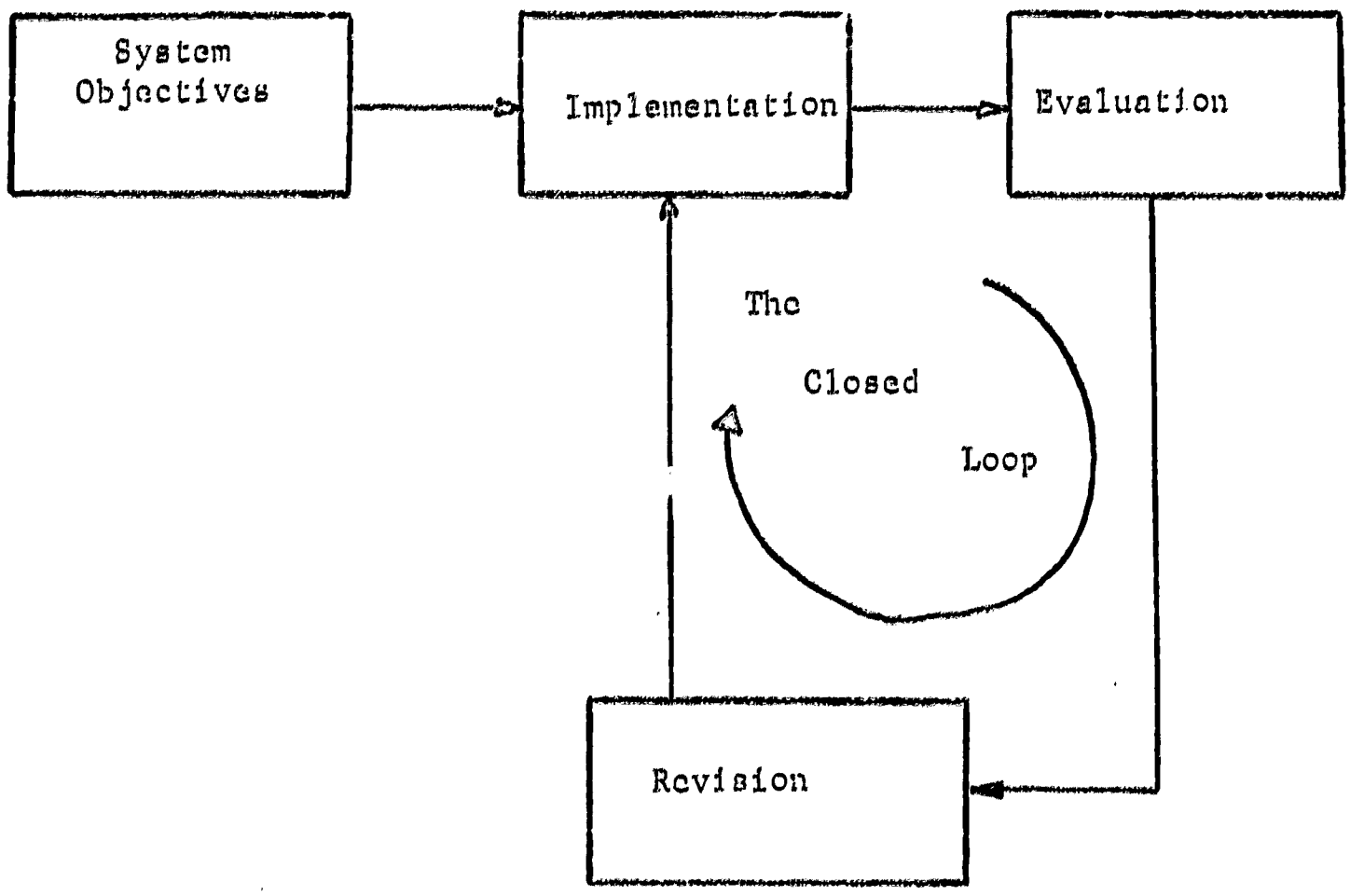

System
Objectives
Implementation
Evaluation
The
Closed
Loop
Revision

Fig. 3

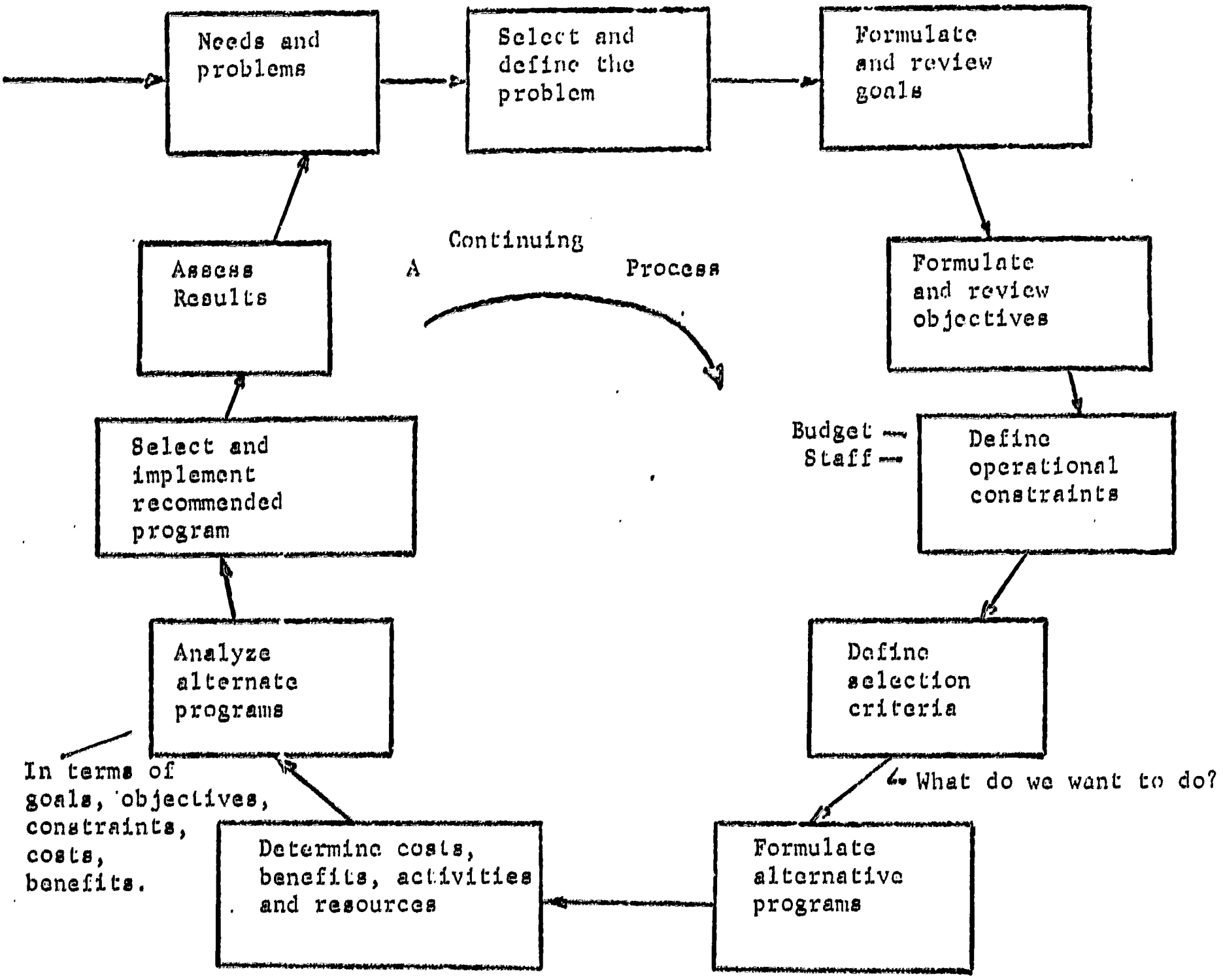

Needs and problems
Select and define the problem
Formulate and review goals
Continuing
A
Process
Assess Results
Formulate and review objectives
Budget —
Staff —
Select and implement recommended program
Define operational constraints
Analyze alternate programs
Define selection criteria
In terms of goals, objectives, constraints, costs, benefits.
What do we want to do?
Determine costs, benefits, activities and resources
Formulate alternative programs

Fig. 4

(3) Decide upon a number of alternative methods for achieving these objectives.

(4) Devise alternative first generation LRC systems, evaluating each on the basis of potential costs, problems, effectiveness, etc. Outline the directions that future expansions of the system will take.

(5) Choose an alternative. Plan successive generations of the system.

3. Design for a Learning Resources System

The following is a summary of a preliminary design for a comprehensive LRC for Santa Barbara City College.

3.1 Diagnostic Subsystem

The Scholastic College Aptitude Test currently used as a screening examination will become a prediagnostic test for the Learning Resources Center. Students scoring below the 30th percentile will be invited by counselors to enroll for nine units of work in the LRC. Students enroll voluntarily. Those scoring above the 30th percentile may be referred to the center by counselors or teachers for special help or may "walk in" seeking help without formal referral.

Once in the LRC students receive diagnostic testing designed to identify specific learning difficulties or deficiencies. Tests in reading skills, writing, mathematics, and study skills will be selected from existing commercial tests or developed and validated locally.

Medical testing will also be provided in order to reveal any physiological problems that may be acting to impair the students' effectiveness. Eyesight and hearing tests are especially important. One study at Los Angeles City College (18) has indicated that 25% of all students on academic probation were in need of corrective lenses.

3.2 Scheduling Subsystem

Students enrolling for 9 units of work in the LRC will be randomly assigned to small groups of approximately ten students. These groups will meet in weekly one hour sessions with 1-3 student tutors and a faculty advisor. Each advisor-tutor-student group will remain intact throughout the semester. The weekly meeting is of a discursive or maieutic group type, as described by Glotthorn (12). (Fig. 5) Students are scheduled individually or in smaller groups into reading, writing, mathematics, or other activities prescribed for them on the basis of diagnostic testing. Tutorial sessions are scheduled individually as needed.

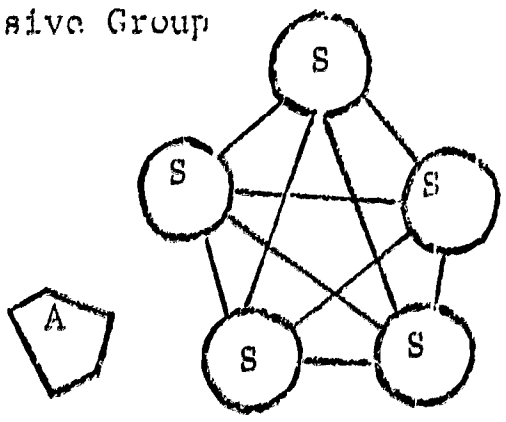
The purpose of the small group scheduling is two-fold: (1) communication between student and advisor, and between student and tutor, will be facilitated; (2) group dynamic processes may be encouraged (14). Group cohesiveness and peer group identification will be promoted and mutual support of the group will be provided. It is hoped in this way to build individual confidence, reduce dropouts from the program, and provide close supportive relationships. (3) The weekly discursive group sessions can be used to provide very direct feedback to the advisor on the feelings and problems of his students. A major task is to bring the failure syndrome out into the open and remove it.

Student tutors are paid by the hour for the hours actually spent tutoring. This encourages them to work to kepp students in the program and to keep the group intact.

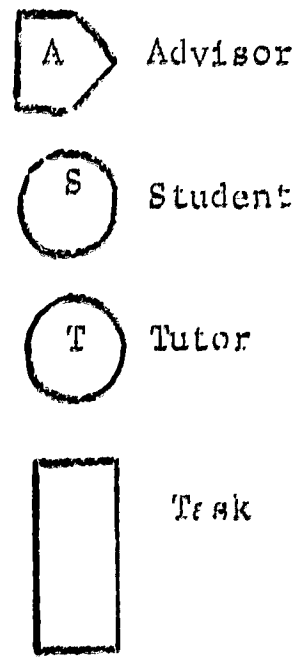
3.3 Distribution Subsystem

The LRC is a physical facility housing a reading lab, writing lab, math lab, self-instructional materials center, center counselor, tutorial center with carrels and study areas, offices and small group contact areas. Expensive and complex software distribution systems such as dial access or ITV have been discarded in favor of the tutorial approach.

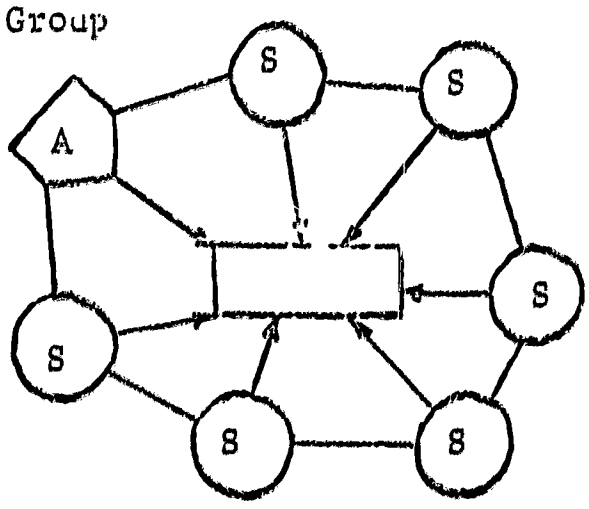
Discursive Group



Free discussion by students
with the advisor in a supporting role



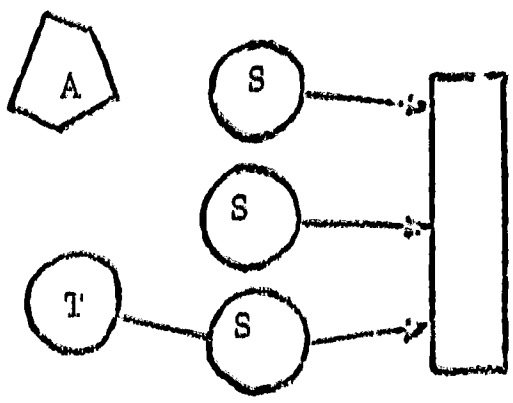
Maieutic Group



The advisor poses a question that can best be answered by open and honest exchange of informed opinion. The advisor is a leader and a participant in the search for an answer.

Tutorial group

Task Group



The group activities are centered individually and collectively on the accomplishment of a task of common interest.

Fig. 5

Evidence exists indicating that the tutorial approach is highly effective in reading and writing. (29) (Fig. 6)

Students not enrolled in the LRC for credit may use the LRC services on a "walk in" or "referral" basis.

3.4 Instruction Subsystem

On the basis of diagnostic pretesting students will receive individually prescribed instruction in the form of small group instruction, tutoring, programmed instruction, supervised writing, personalized reading development activities, audio-tutorial units, films, seminars, or large group lectures.

It is important that the LRC not simply provide additional dull remedial drills designed to help "ill-prepared" students "catch up." The low ability student would find such treatment humiliating, discouraging, and ultimately unrewarding. Instead we must redesign what is to be learned and how this learning can best be achieved. Much of this may be done in short course-like segments, but these must be designed so as to give the student respect and recognition from the outset.

Orientation to the LRC will be an important part of the instructional program. Orientation is an on-going process in which the student is informed of the values of the college, the goals of the LRC in relation to him, the priorities under which the LRC operates, the procedures that have been established for reaching the goals, the roles played by individuals in the LRC, and the nature of the feedback he will receive as he progresses toward the goals. The purpose of this orientation process is to develop in the student a sense of confidence in his advisor, his tutors, his fellow students, in the LRC, in the college supporting the LRC, in the goals towards which he is working, and finally, toward his own ability to reach these goals. The instructional process is not designed simply to transmit information but to promote and maintain a feeling of high morale and teamwork.

3.5 Evaluation Subsystem

All testing in the LRC will be either diagnostic or achievement directed. Testing must be non-punitive and not tied to a system of grades or other punishment. (15) The failure-oriented student has been locked into a self-maintained cycle of failure producing punishment producing failure producing more punishment, and so on. If he is to break the cycle we must remove the punishment and place emphasis, and whatever reward system we may be able to command, on success. Evaluation is extremely important, but it must be seen as a non-punitive, positive influence.

3.6 Information Subsystem

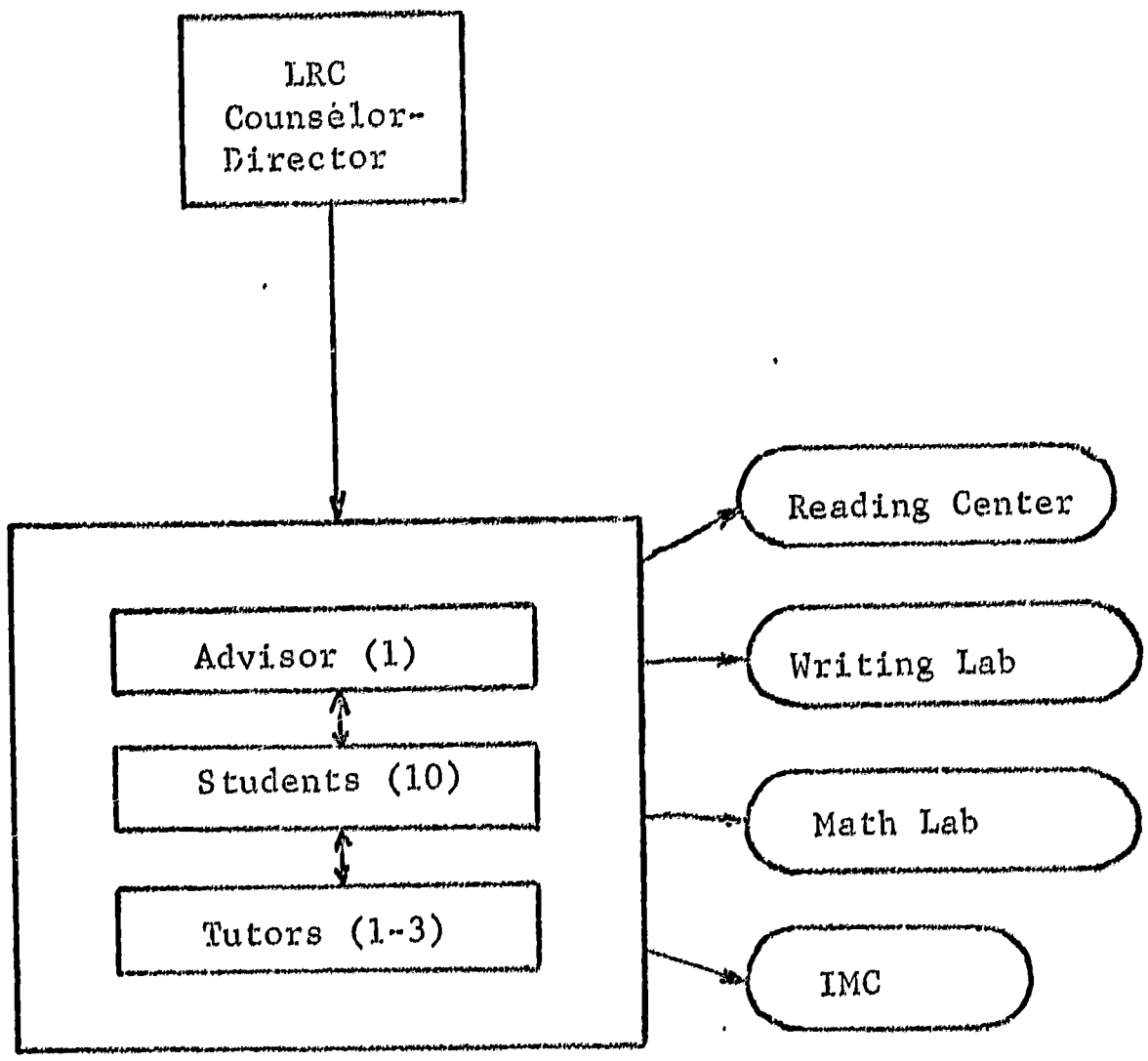
It is hoped that all student records may be kept in a form readily accessible to computer processing so that surveys of student characteristics and achievement may be made quickly. Research on the functioning of the LRC will be necessary if it is to be continuously modified for more effective operation.

3.7 Management Subsystem

The operation of the LRC will be under the supervision of a counselor-psychologist-director who will work with advisors and tutors in an attempt to help them direct their activities more effectively. He will act as an in-house counselor for students enrolled in the center. The reading, writing, and math labs will be under the direction of specialists in these areas.

4. Conclusions

Winston Churchill once said that there is nothing so unequal as the equal treatment of unequals. The ideal of equal educational opportunity that we have made the basis of the junior college concept cannot be based simply on equal treatment of individuals. If it is to be meaningful, it must be based on the real possibility of achievement independent of educational, economic or social background.



The Task Group

Fig. 6

Junior college educators must become aware of the failure-prone, failure-oriented, individuals in their institutions. Traditional methods of instruction are inadequate for assuring the success of these people and new methods based on the acceptance of the individual and a belief in his fundamental worth must be developed.

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